

# ABSTRACT OF THE DISCLOSURE:

The aim of the present invention is to estimate EDR directions in a  
5 single index model composed of a large number of variables with simple  
calculations without using the inverse matrix of the variance-covariance  
matrix and principle component analysis. Data conversion means 21  
receives, from an input device 3, data to be analyzed, the data composed of  
sets of response variables and explanatory variables, standardizes the  
10 explanatory variables, and sends them to slice average calculating means  
22. The slice average calculating means 22 divides the data into two slices  
with reference to the median of the response variables to calculate the mean  
vector of the explanatory variables on a slice basis. The calculated mean  
vectors are sent to EDR direction calculating means 23. The EDR direction  
15 calculating means 23 calculates the difference between the mean vectors for  
respective slices to estimate an EDR direction. The EDR direction  
calculating means 23 also corrects the estimated EDR direction using the  
inverse matrix of the correlation matrix of the explanatory variables, if any.  
Both the estimated EDR direction and the corrected EDR direction are sent  
20 to the data conversion means 21, and transformed by the data conversion  
means 21 into the original coordinate system.